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INTERACTION VISION: EXPRESSING AND IDENTIFYING THE QUALITIES OF USER-PRODUCT INTERACTIONS

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ABSTRACT
The rapidly growing market of interactive products, systems and services as well as the development of new design approaches, such as experience-driven design and service design, presents new challenges for design education. Designing for experiences or services requires a design approach that, to a greater extent than traditional product design, focuses on the experiential effects products should have on the user while interacting with them and what qualities these interactions between product and user should have to actually induce these effects. However, envisioning this in a early stage in the design process proves to be challenging for product design students, who have been traditionally trained to think of a product in terms of appearances and functionalities rather than experiences and interactions.
This paper presents a technique for generating and communicating a vision of a product's intended interactions. The technique is explained and illustrated within the setting of a specific design course. A workshop, in which students explored various ways of expressing an interaction vision, is described and its results discussed. Following this workshop, some examples of interaction visions and their corresponding designs from the course are presented. Finally, the specific merits and pitfalls of the technique for design education are discussed.

Keywords: Interaction design, experience-driven design, design metaphors, creative techniques

1 INTRODUCTION

The rapidly growing market of interactive products, systems and services [1] as well as the development of new design approaches, such as experience-driven design [2] and service design [3], present new challenges for design, and thus for design education. One of these challenges is having design students identify and express early in their design process those qualities of a product, system or service that will shape its interactive character and thus for a substantial part the overall experience of the user. For instance, the fluency and simplicity of the gesture used to unlock an iPhone is just one example of the quality of an interaction that contributes to the phone's user-friendly, playful and innovative character.
To communicate the design of a future product a design student is traditionally trained in a range of visualization techniques, such as sketching, cardboard modeling and 3D computer modeling, while other techniques such as personas [4] are used to depict the target users. Getting a grip on the desired character of product-user interactions, however, requires envisioning the intended relationship between product and user rather than focusing on either the product or the user in isolation. Although storyboards are common means to present both product and user in an existing or future context [5], they usually show product-user interactions on a very functional level, thus falling short when it comes to representing the actual experience these interactions should evoke.
Envisioning this experience in an early phase in the design process, would provide designers with a different perspective on their design situation, one that is not limited by constraints coming from the context of the product or the user. Rather than focusing on product properties, such as functionalities or materials, or user characteristics, such as physical or cognitive abilities, this would enable them to express and indentify which qualities the interactions between product and user should have to actually induce the intended experience.

2 INTERACTION VISION

This paper presents a technique, called interaction vision, for generating and communication such interaction qualities. The main objective of this technique is to create a rich representation of the moods, feelings or experiences that the interactions with the future product should bring for the user. Building on the general creative principle of using metaphors and analogies as containers to carry over concepts from one situation to another, the qualities of the interactions that bring about the character as expressed in the representation, should then be transferred to the actual design situation.
The interaction vision technique, which is derived from the Vision in Product Design (ViP) method, a interaction-centered and context-driven design approach, that has product-user interactions as its core focus [6], starts by identifying an event unrelated to the context being designed for, in which the desired character of the interactions manifests itself in a unified way. This character should then be captured in one short textual statement. Subsequently, this statement is to be explored using various means and media, such as verbal descriptions, collages, movie clips or enactments, to bring out the specific qualities of the interactions that make up for it. The qualities expressed in this vision should then be transferred by the designer to the particular design context at hand by translating them into actual product qualities, such as form, material, texture and color.

3 WORKSHOP

To explain the interaction vision technique further, its application within a specific course will be described. Exploring Interactions is a conceptual design course, in which the interplay between the properties of a product and the abilities, goals and behavior of a user in relation to the context in which the product will be used, should be explored and designed [7]. Envisioning the specific character of the interactions between the product and its user, is therefore a pivotal element in this course. Experiences from previous years had shown that many students had difficulties with expressing this character in a communicative way, and, subsequently, transferring the qualities that make up for this character to their own design context. Therefore it was decided to organize a small workshop, during which the students could practice these steps. The aim of the 4 hour-workshop was to have students explore (a) various means for communicating an interaction vision, and (b) how an interaction vision might drive the generation of product ideas.

3.1 Set-up

Students worked in teams of four or five, while two tutors were present to facilitate the workshop, which was staged in three parts. Since not all students were at a point in their own design process where they already had formulated their own interaction vision, they were giving a fictitious design goal to work with in this workshop as well as a short textual statement, in which the desired character of the intended interactions was defined. The goal was to design an inspiring lunch experience for customers of the university canteen, while the interaction vision was stated as “Refreshing Openness’.

Part 1: Communicating an interaction vision (75 minutes)
In this first phase the students were to explore various techniques to communicate the interaction vision, other than the textual statement that was already provided. These techniques included:

- A verbal metaphor (or analogy)
- A static visual metaphor (image or collage)
- A dynamic visual metaphor (film clip or film collage)
- Multi-sensorial compositions (e.g. a visual or tactile peep-box, a sound composition, compilations made from existing objects or from self-made objects)
- A role play

Each team was then to explore and create within 45 minutes an interaction vision expressing “refreshing openness” using one of these techniques. Since the aim was to have the students experience how these different techniques would lead to different expressions, each team was assigned a different technique. At the end of this first phase all teams presented their interaction vision, followed by a discussion.

Part 2 – Analyzing an interaction vision (60 minutes)
In the second phase of the workshop, the students were to identify those design qualities that were represented in the different interaction visions. These should still be rather general qualities, which did not have to be related to canteen situation yet. Possible qualities that would become apparent through the analysis might, for example, be the use of wide-angle views, bright and saturated color, huge contrasts in light etc. These design qualities could then be subsequently used as means to evoke or induce the desired character of a possible solution. Each team was given 30 minutes to analyze all interaction visions, after which a discussion with the whole group was conducted, in which the results were presented and discussed.

Part 3 – Generating design ideas (60 minutes)
Finally, in the third phase of the workshop, the students were asked to generate ideas for possible design interventions in the IDE canteen (e.g. an open space in middle; large fruit bowls with fresh fruits at the beginning, etc.), which would induce or evoke the desired character as expressed in the created interaction visions. This part also concluded with a short presentation by each team, followed by a discussion of about the concept and use of interaction visions in design and its application in the Exploring Interactions course.

3.2 Workshop results
Comparing the various techniques which were explored in part 1 resulted in some interesting insights. The three groups which were to communicate an interaction vision in a metaphorical way, either through a verbal statement, a collage or a movie, all started with making a mindmap, first exploring the concept of “refreshing openness” in a verbal way. The first group eventually decided on the metaphor of “finding the last piece of a puzzle”, while the collage group listed a number of keywords, based on which they then started to look on the internet for matching images, which were then put together. From all the techniques used, the short clip generated by the movie group, showing a man diving into the ocean from a high cliff, did evoke the strongest, most uniform feeling of “refreshing openness”. Its combination of storyline, dynamics and music all contributed to this feeling, making this technique because of its richness the most powerful one for expressing an interaction vision.
The other two groups somewhat struggled with finding a good approach to communicating the vision. The multi-sensory team left the studio to wander around the school, looking for objects that they might use to communicate their vision. In the end, they ended up with a mixed and rather random collection of ‘objet trouvé’, which they used to explain their interaction vision, referring to these objects in mainly literal, non-metaphorical ways. Finally, the group who were to stage a role play, had trouble in coming up with a meaningful scenario. Most of the students are not very experienced in role playing ("we are designers, not actors you know" [8]), and maybe as a result of this, their acting was somewhat quick and superficial, having not much expression and emotion that clearly communicated some interaction qualities.
The analysis of the created interaction visions in part 2 proved to be fruitful, especially in the group discussion at the end. As a first step the group identified a number of ‘qualities of interactions’, such as “inviting”, “flexible” and “approachable”, which were then supplemented by a list of qualities of things’, such as “soft”, “lightweight”, “layered”, “calm” and “transparent”. Combining these two sets of qualities then supported them in part 3 of the workshop. Although this part was too short to result in any substantial design ideas, taking the step from general interaction vision to the specific problem situation, even in a quick and dirty way, made the students more aware of the benefits of creating an interaction vision and its possible use in their own design process, as was concluded in the final discussion.

4 EXAMPLES OF INTERACTION VISIONS
Following the workshop the students refined their personal interaction vision. Next to this, they started developing rough models, to explore how the intended character of the interactions, as defined in their vision, might be translated into actual product properties. To determine to what extent these properties evoke people to interact with the product in the way that is intended, short actions or scenarios were to be played out and evaluated. Refining these models should then result in an experiential prototype, which should be tested in an actual use situation or with a simulated set-up. The next paragraphs show

three examples of students projects, in which different means were used to communicate an interaction vision.

4.1 Picture

The design goal is this project was to stimulate social interactions between museum guards and museum visitors in a personal and natural way. The interaction vision was stated as “warm glimpse”, while the interaction qualities that were deduced from this vision were “warm”, “subtle”, “natural” and “friendly”. The final product, called Hand Out Map, is a small paper booklet, which the guards can use to create personalized museum maps while having short conversations with visitors.

Figure 1. From left to right: A picture expressing “warm glimpse”, the Hand Out Map, a picture of the intended interactions (Emma Haagen)

The left picture in Figure 1, which was selected to communicate the intended interaction vision, certainly succeeds in suggesting a relevant mood. The “warm glimpse” is clearly represented, although in a very literal way. The smile of the girl evokes a warm feeling through its natural and friendly character, which is enforced by the other women in the picture, whose expression is rather closed and distant. In terms of interactions, however, the picture provides less relevant information. The static image does not express movements or behavior, making it difficult to deduct any qualities of interaction directly from the picture. Product properties that might be derived from the picture are the use of natural materials, layered structures and the use of contrasts (light vs. dark, open vs. closed). Some of these properties actually ended up in the final design (middle picture), for example in the use of a paper booklet instead of an electronic device. The right image in Figure 1, showing the intended interaction between a guard and a visitor, can again be easily associated with the feeling of a ‘warm glimpse’,

4.2 Collage

The design goal in this project was to enable students to manage their money in a pleasant and satisfying way. The interaction vision was stated as “like a talk with a good friend”, while the interaction qualities that were deduced from this vision were “familiar”, “personal”, “open” and “nonjudgmental”. The final product, called Wallet 2.0, is a wallet that physically, intuitively and privately represents the value of digital money.

The left image in Figure 2 again shows how the intended interaction vision was communicated, this time through multiple pictures. While some of these are rather abstract and thus open for many interpretations, others are more specific in the message they convey. Together they do provide a richer pallet for the designer to make the transition from qualities of interaction to qualities of products. Especially the pictures involving people interaction with things and/or with each other, could give him valuable directions on how to translate the desired character of the interaction into actual product properties.

Figure 2. From left to right: A collage expressing "a talk with a good friend", the Wallet 2.0, a storyboard of the intended interactions (Katja Leuschner)

The final design, as shown in the middle image, communicates the account balance or budget of its owner through its hardness and texture. Inside the wallet the balance can be checked in a personal and inconspicuous way through the use of a fingerprint. The scenario in the right image shows how this last interaction gives the user a subtle and private indication of his financial status.

4.3 Movie

The design goal in this project was to inspire electronic musicians by helping them to remember sonic events. The interaction vision was stated as "ordered randomness", while the interaction qualities that were deduced from this vision were "controlled", "Effortless" and "ordered". The final product, called DropZone, is an innovative user interface that supports effortless opening of existing music files.

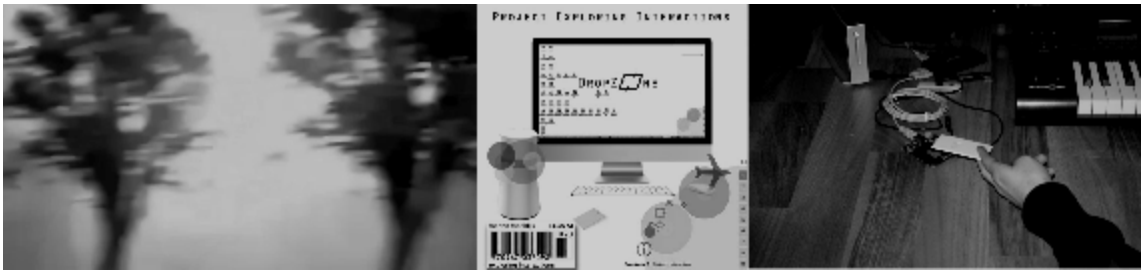

Figure 3. From left to right: A still from the movie clip expressing "Ordered Randomness", the DropZone interface, a picture showing the intended interactions (Menno Meeldijk)

The short movie (32 seconds) is split up into two distinct scenes of about 16 second each. The first scene (Figure 3) shows a rather chaotic sequence of trees rapidly flashing by, shot with an unsteady camera and played at an accelerated speed, while a voice-over is declaiming "Unconsciously first, he was experiencing flashes of sunlight", supplement with some nervous, high-pitched synthesizer sounds. The second scene then abruptly breaks with this by showing a person writing something down on a sheet of paper while lying in bed, the only sound being the scribbling of pen on paper. The strong contrast between the two scenes emphases the desired transition between chaos and control. In the final design this transition is expressed in the interactions of swiping an RFID card on a reader station, thus recalling existing music files, as well as dragging and dropping these files in a dedicated area of the computer interface.

5 DISCUSSION

The first step of identifying the character they would like the interactions with their design to have, required from the students that they start 'searching' for this character in situations other than the one they are designing for. This searching was in most cases done by recalling from memory previous situations, encounters or experiences, in which this character has manifested itself. Personal experiences, especially childhood memories, appeared to be rich resources for this, presumably because they have a higher impact than more general situations and can thus be recalled more vividly. As such this part of the technique has a rather private and introspective nature.

The identified character should be then expressed in a meaningful way by means of words, pictures, sounds, videos or enactments. Both the results from the workshop and the experiences from the course indicated that a rich and dynamic representation facilitates the communication of this character. Especially video, through its potential to combine images, music and sounds in a dynamic way, appears to be a powerful medium to articulate strong feelings and emotions as well as to show and reveal the interactions that evoke these experiences. How to best create a video expressing an interaction vision, however, is a topic which needs further research. Rather than showing a possible scenario of use of the product to be designed, the video should convey experiential effects, emotions and feelings in ways that should enable transfer to the actual design situation at hand.

This final step of bringing over the interaction qualities expressed in the interaction vision to a particular design context, proved to be the most difficult part of the technique. It involves translating abstract interaction qualities, such as "subtle" or "respectful" into concrete product properties, such as material, form, material, color, dynamics, movement, rhythm etc., that should induce these qualities. Many students in the Exploring Interactions course found it really hard to make this conceptual leap, struggling with getting from the abstract and metaphorical level of their interaction vision to the concrete level of their design. A possible approach to this, going from 'qualities of interaction' to 'qualities of things', was quickly probed during the workshop, but needs to be developed further.

Finally, while the workshop served its purpose of introducing all students to the interaction vision technique, it by itself appeared not enough for the majority of them to actively apply the technique throughout their own design process. Given the perceived complexity of the technique for most students, they tend to shy away from using it, thus avoiding bringing an experiential dimension to their design process. Yet, from the perspective of design education, the interaction vision technique as discussed in this paper, provides design students with an instrument to consider, in an early stage in their process, the experiential effects their designs should have rather than the functions they should support. With an increasing attention for experience-driven design and service design, both aimed at designing such effects, and an ever growing market of interactive products, systems and services, which should actually evoke these effects, such an instrument could therefore be a valuable addition to any design student's toolkit.

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